

## BIOGRAPHICAL SKETCH

### GARY L. ANDERSEN

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### (a) Professional Training

Undergraduate Institution: Northwestern University, Evanston, Illinois,  
**B.A.** Biology 1978  
Graduate Institution: University of California, Berkeley, California  
**M.Sc.** Plant Pathology 1982  
**Ph.D.** Plant Pathology 1993

### (b) Appointments:

2012 – Present Adjunct Professor, Department of Environmental Science, Policy, and Management, University of California, Berkeley, CA  
2011 – Present Senior Scientist, Ecology Department Head, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA  
2003-2011 Staff Scientist and Group Leader, Molecular and Microbial Ecology, Earth Sciences, Lawrence Berkeley National Laboratory, Berkeley, CA  
1997-2002 Sr. Biomedical Scientist, Biology & Biotechnology Res. Prog., Lawrence Livermore National Laboratory, Livermore, CA  
1993-1996 Postdoctoral Fellow, Department of Infectious Diseases, Duke University Medical School, Durham, NC

### (c) Peer-Reviewed Publications (h-index 36):

1. Probst, A. J., Holman, H. Y., DeSantis, T. Z., Andersen, G. L., Birarda, G., Bechtel, H. A., Piceno, Y. M., Sonnleitner, M., Venkateswaran, K., Moissl-Eichinger, C. (2013) Tackling the minority: sulfate-reducing bacteria in an archaea-dominated subsurface biofilm. *ISME J.* **7**: 635-51. PMID: 23178669
2. Korves, T. M., Piceno, Y. M., Tom, L. M., DeSantis, T. Z., Jones, B. W., Andersen, G. L., Hwang, G. M. (2013) Bacterial communities in commercial aircraft high-efficiency particulate air (HEPA) filters assessed by PhyloChip analysis. *Indoor Air.* **23**:50-61 PMID: 22563927
3. Chakraborty R, Borglin SE, Dubinsky EA, Andersen GL, Hazen TC. (2012) Microbial response to the MC-252 oil and Corexit 9500 in the Gulf of Mexico. *Front Microbiol.* **3**:357. PMID: 23087678
4. Vaishampayan, P., Probst, A. J., La Duc, M. T., Bargoma, E., Benardini, J. N., Andersen, G. L., Venkateswaran, K. (2012) New perspectives on viable microbial communities in low-biomass cleanroom environments. *ISME J.* **7**: 312-24. PMID: 23051695
5. Lau, S. C., Zhang, R., Brodie, E. L., Piceno, Y. M., Andersen, G., Liu, W. T. (2012) Biogeography of bacterioplankton in the tropical seawaters of Singapore. *FEMS Microbiol Ecol.* 2012 Dec 13 [Epub ahead of print] PMID: 23237658
6. Hayden, H. L., Mele, P. M., Bougoure, D. S., Allan, C. Y., Norng, S., Piceno, Y. M., Brodie, E. L., DeSantis, T. Z., Andersen, G. L., Williams, A. L., Hovenden, M. J. (2012) Changes in the microbial community structure of bacteria, archaea and fungi in response to elevated CO<sub>2</sub> and warming in an Australian native grassland soil. *Environ Microbiol.* **14**:3081-96. PMID: 23039205
7. Hwang, C., Ling, F., Andersen, G. L., LeChevallier, M. W., Liu, W. T. (2012) Microbial community dynamics of an urban drinking water distribution system subjected to phases of

- chloramination and chlorination treatments. *Appl Environ Microbiol.* **78**:7856-65. PMID: 22941076
- 8. Vaziri, N. D., Wong, J., Pahl, M., Piceno, Y. M., Yuan, J., DeSantis, T. Z., Ni, Z., Nguyen, T. H., and G. L. Andersen (2012) Chronic kidney disease alters intestinal microbial flora. *Kidney Int.* **83**:308-15. PMID: 22992469
  - 9. Cruz-Martínez K, Rosling A, Zhang Y, Song M, Andersen GL, Banfield JF. (2012) Effect of rainfall-induced soil geochemistry dynamics on grassland soil microbial communities. *Appl Environ Microbiol.* **78**:7587-95 PMID: 22904056
  - 10. Sercu B, Jones AD, Wu CH, Escobar MH, Serlin CL, Knapp TA, **Andersen GL**, Holden PA. (2012) The Influence of In Situ Chemical Oxidation on Microbial Community Composition in Groundwater Contaminated with Chlorinated Solvents. *Microbiol Ecol.* **65**:39-49 PMID: 22864851
  - 11. Beazley MJ, Martinez RJ, Rajan S, Powell J, Piceno YM, Tom LM, **Andersen GL**, Hazen TC, Van Nostrand JD, Zhou J, Mortazavi B, Sobecky PA. (2012) Microbial community analysis of a coastal salt marsh affected by the deepwater horizon oil spill. *PLoS One.* **7**:e41305 PMID: 22815990
  - 12. Tang, X., Freitak, D., Vogel, H., Ping, L., Shao, Y., Cordero, E. A., Andersen, G., Westermann, M., Heckel, D. G., Boland, W. (2012) Complexity and variability of gut commensal microbiota in polyphagous lepidopteran larvae. *PLoS One.* **7**:e36978. PMID: 22815679
  - 13. Human Microbiome Consortium. (2012) A framework for human microbiome research. *Nature* **486**:215-221. PMID: 22699610
  - 14. Human Microbiome Consortium. (2012) Structure, function and diversity of the healthy human microbiome. *Nature* **486**:207-214. PMID: 22699609
  - 15. Reith, F, Brugger, J., Zammit, C. M., Gregg, A. L., Goldfarb, K. C., Andersen, G. L., DeSantis, T. Z., Piceno, Y. M., Brodie, E. L., Lu, Z., He, Z., Zhou, J., Wakelin, S. A. (2012) Influence of geogenic factors on microbial communities in metallogenic Australian soils. *ISME J.* **6**:2107-18 PMID: 22673626
  - 16. Lam, V., J. E. Moulder, N. H. Salzman, E. A. Dubinsky, G. L. Andersen, J. E. Baker. (2012) Intestinal Microbiota as Novel Biomarkers of Prior Radiation Exposure. *Radiation Research* **177**: 573-583. PMID: 22439602
  - 17. Handley, K. M., Wrighton, K. C., Piceno, Y. M., Andersen, G. L., DeSantis, T. Z., Williams, K. H., Wilkins, M. J., N'guessan, A. L., Peacock, A., Bargar, J., Long, P. E., Banfield, J.F. (2012) High-density PhyloChip profiling of stimulated aquifer microbial communities reveals a complex response to acetate amendment. *FEMS Microbiol Ecol.* **8**:188-204. PMID: 22432531
  - 18. Dubinsky, E.A., L. Esmaili, J. R. Hulls, Y. Cao, J. F. Griffith, G. L. Andersen. (2012) Application of Phylogenetic Microarray Analysis to Discriminate Sources of Fecal Pollution. *Environmental Science & Technology* **46**: 4340-4347 PMID: 22360280
  - 19. Lee, P. K., Dill, B. D., Louie ,T. S., Shah, M., Verberkmoes, N. C., Andersen, G. L., Zinder, S. H., Alvarez-Cohen, L. (2012) Global Transcriptomic and Proteomic Responses of Dehalococcoides ethenogenes Strain 195 to Fixed Nitrogen Limitation. *Appl Environ Microbiol.* **78**:1424-1436. PMID: 22179257
  - 20. McDonald, D., Price, M. N., Goodrich, J., Nawrocki, E. P., DeSantis, T. Z., Probst, A., Andersen, G. L., Knight, R., Hugenholz, P. (2012) An improved Greengenes taxonomy with explicit ranks for ecological and evolutionary analyses of bacteria and archaea. *ISME J.* **6**:610-618. PMID: 22134646
  - 21. He, Z., Piceno, Y., Deng, Y., Xu, M., Lu, Z., DeSantis, T., Andersen, G., Hobbie, S. E., Reich, P. B., Zhou J. (2012) The phylogenetic composition and structure of soil microbial communities shifts in response to elevated carbon dioxide. *ISME J.* **6**:259-27. PMID: 21796217
  - 22. De Jesús-Laboy, K. M., Godoy-Vitorino, F., Piceno, Y. M., Tom, L. M., Pantoja-Feliciano, I. G., Rivera-Rivera, M. J., Andersen, G. L., Domínguez-Bello, M. G. (2012) Comparison of the Fecal Microbiota in Feral and Domestic Goats. *Genes* **3**:1-18.
  - 23. Wakelin, S. A., Anand, R. R., Reith, F., Gregg, A. L., Noble, R. R., Goldfarb, K. C., Andersen, G. L., DeSantis, T. Z., Piceno, Y. M., Brodie, E. L. (2011) Bacterial communities associated with

- a mineral weathering profile at a sulphidic mine tailings dump in arid Western Australia. *FEMS Microbiol Ecol.* **79**:298–311. PMID: 22092956
24. Lee, P. K., Warnecke, F., Brodie, E. L., Macbeth, T. W., Conrad, M. E., Andersen, G. L., Alvarez-Cohen, L. (2012) Phylogenetic Microarray Analysis of a Microbial Community Performing Reductive Dechlorination at a TCE-Contaminated Site. *Environ Sci Technol.* **46**:1044-54. PMID: 22091783
25. Kellogg, C. A., Piceno, Y. M., Tom, L. M., DeSantis, T. Z., Zawada, D. G., Andersen, G. L. (2011) PhyloChip™ microarray comparison of sampling methods used for coral microbial ecology. *J Microbiol Methods.* **88**:103-109. PMID: 22085912
26. García-Amado, M. A., Godoy-Vitorino, F., Piceno, Y. M., Tom, L. M., Andersen, G. L., Herrera, E. A., Domínguez-Bello, M. G. (2011) Bacterial Diversity in the Cecum of the World's Largest Living Rodent (*Hydrochoerus hydrochaeris*). *Microb Ecol.* 2011 Nov 15. [Epub ahead of print] PMID:22083250
27. Hwang, C., Ling, F., Andersen, G. L., Lechevallier, M. W., Liu, W. T. (2011) Evaluation of Methods for the Extraction of DNA from Drinking Water Distribution System Biofilms. *Microbes Environ.* 2011 Nov 10. [Epub ahead of print] PMID:22075624
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30. Van Trump JI, Wrighton KC, Thrash JC, Weber KA, Andersen GL, Coates JD. (2011) Humic acid-oxidizing, nitrate-reducing bacteria in agricultural soils. *MBio* 2:e00044-11 PMID: 21750120
31. Banning NC, Gleeson DB, Grigg AH, Grant CD, Andersen GL, Brodie EL, Murphy DV. 2011. Soil microbial community successional patterns during forest ecosystem restoration. *Appl Environ Microbiol.* **77**:6158-6164. PMID: 21724890
32. Cooper, M., La Duc, M. T., Probst, A., Vaishampayan, P., Stam, C., Benardini, J.,N., Piceno, Y.,M., Andersen, G. L., Venkateswaran, K. (2011) Assessing the Cleanliness of Surfaces: Innovative Molecular Approaches vs. Standard Spore Assays. *Appl. Environ. Microbiol.* **77**:5438-5444. PMID: 21652744
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35. DeSantis, T. Z., Keller, K., Karaoz, U., Alekseyenko, A. V., Singh, N. N., Brodie, E. L., Pei, Z., **Andersen, G. L.**, Larsen, N.(2011) Simrank: Rapid and sensitive general-purpose k-mer search tool. *BMC Ecol.* **11**:11. PMID: 21524302
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42. Hazen, T. C., Dubinsky, E. A., Desantis, T. Z., Andersen, G. L., Piceno, Y. M., Singh, N. et. al. (2010) Deep-Sea Oil Plume Enriches Indigenous Oil-Degrading Bacteria. *Science.* 330:204-208 PMID: 20736401
43. Vaishampayan, P., Osman, S., Andersen, G., and Venkateswaran, K. (2010) High-density 16S microarray and clone library-based microbial community composition of the phoenix spacecraft assembly clean room. *Astrobiology* **10**:499-508. PMID: 20624058
44. Wu, C. H., Sercu, B., Van de Werfhorst, L. C., Wong, J., DeSantis, T. Z., Brodie, E. L., Hazen, T. C., Holden, P. A., and Andersen, G. L. (2010) Characterization of coastal urban watershed bacterial communities leads to alternative community-based indicators. *PLoS One.* **5**:e11285 PMID: 20585654
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61. Cruz-Martínez, K., Suttle, K. B., Brodie, E. L., Power, M. E., Andersen, G. L., Banfield, J. F. (2009) Despite strong seasonal responses, soil microbial consortia are more resilient to long-term changes in rainfall than overlying grassland. *ISME J.* **3**: 738-744. PMID: 19279669
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**(d) Book chapters:**

1. **Andersen, G. L.**, He, Z., DeSantis, T. Z., Brodie, E. L., and Zhou, J. (2010) The Use of Microarrays in Microbial Ecology, pp 87-110. In Liu, W.T. and Jansson J. K. (ed), *Environmental Molecular Microbiology*. Caister Academic Press (January, 2010). ISBN 978-1-904455-52-3
2. **Andersen, G. L.**, Frisch, A.S., Kellogg, C.A., Levetin, E., Lighthart, B., Paterno, D. (2009) Aeromicrobiology/Air Quality. In Schaechter, M (editor-in-chief) *Encyclopedia of Microbiology, Third Edition*. Academic Press (May 15, 2009). ISBN 978-0-12-373939-1
3. Brodie, E. L., DeSantis, T.Z., Piceno, Y. M. and **Andersen, G. L.** (2009) High density DNA microarray analysis for monitoring microbial community composition and dynamics. In Kowalchuk, G.A. (ed), *Molecular Microbial Ecology Manual*. Kluwer Academic Publishers. (In press.)
4. **Andersen, G.L.**, Piceno, Y. M., DeSantis, T. Z. and Brodie, E. L. (2006) What DNA Microarrays Can Tell Us About Bacterial Diversity: A New Light on an Old Question. In Bailey, M.J. (ed), *Microbial Ecology of Aerial Plant Surfaces* Oxford University Press, pp. 251-267. ISBN 978-1845930-61-5

**(e) Research interests and experience:**

I am interested in using molecular approaches to study the dynamics of microbial community structure in the environment. This includes the development of new techniques to dissect the microbial diversity of complex ecosystems. The long-term goal of this research is to integrate different fields of biology (i.e., genomics, ecology, molecular biology, proteomics and bioinformatics) to provide insight into the interactions of environmental microorganisms under stressful conditions. My current research focuses on the microbial ecology of airborne and aquatic bacteria with an emphasis on the natural distribution of pathogens in the environment. I have developed numerous microarray systems for the measurement of microbial diversity and the identification of bacterial communities by 16S and other gene sequences. I have also used microarrays for whole genome expression of genes in response to environmental stimuli.

**(f) Professional Service and Activities:**

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|-----------|--|
| 1999-     | Ad hoc reviewer for the following journals; PNAS, Nature Biotechnology, FEMS Microbiology Ecology, FEMS Microbiology Letters, Environmental Microbiology, Anaerobe, Journal of Bacteriology, Journal of Clinical Microbiology, Microbial Ecology, Atmospheric Chemistry and Physics. |
| 2000-2003 | Member, Joint DOE-DTRA Task Force on Microbial Backgrounds. Washington D.C.  |
| 2001-     | Science Advisor to the Einstein Institute for Science, Health & the Courts (EINSHAC), Washington, D.C.   |
| 2001-2003 | Advisory Committee for Air Force Technical Applications Center, Patrick AFB, FL  |
| 2003-2004 | Member, LBNL Institutional Biosafety Committee.  |
| 2004-     | Editorial Board of Applied and Environmental Microbiology  |
| 2006-     | Genomic Aerobiology Working Group, Alfred P. Sloan Foundation.   |
| 2008-     | Co-founder and member of Scientific Advisory Board, Second Genome Inc.   |

- 2009- Alfred P. Sloan Foundation Scientific Advisory Board Microbiology of the Built Environment.  
2010- Editorial Board of ISME Journal.  
2011- Head, LBNL Institutional Biosafety Committee.

**(g) Honors:**

- 1993 Teaching Effectiveness Award. University of California, Berkeley, CA, 1993  
2000 NAI Directorate Award, LLNL, Livermore, CA.  
2002 Directors Award, LLNL, Livermore, CA.  
2008 R&D 100 Award for Berkeley PhyloChip.  
2008 Overall Bronze Medal winner, and Environment category winner, Wall Street Journal Technology Innovation Awards.  
2012 Directors Award for Exceptional Achievement, Lawrence Berkeley Lab.

**(h) Research Supervision:**

*Graduate Students* - Ph.D. Committee Member for Mareike Viebahn, Utrecht University, Shini Sunagawa, UC Merced, Collin Closek, UC Merced, Rebecca Daly, UC Berkeley, and Pei-Ying Hong, National University of Singapore.

*Post Doctoral Scientists (completed)* – Lyndsay Radnedge, Peter Agron, Eoin Brodie, Stéphanie Bernard (Swarbreck), Cindy Wu, Kristen DeAngelis.

*Post Doctoral Scientists (current)* Eric Dubinsky.

**(j) Patents:**

- Array for Detecting Microbes. PCT/US2007/024720.  
Heavy Metal Biosensor. JIB-2368PCT  
Improved Method for Phylogenetic Microarray Design and Analysis. IB-2733).  
Nucleotide Sequences Specific to *Bacillus anthracis*. Number 7,494,778.